



CAA NORWAY

ADS-B

What can it do for GA?



Do you need a mode S transponder?

Mode S is a classic transponder, but has

- * a singular ID of the aircraft
- * selective interrogation
- * datalink communication





Transponders are backwardly compatible

Type transponder	Mulig overvåking
No transponder	Primary-Radar (PR)
Mode A	PR + identifikationskode (A)
Mode C	PR+A+barometric altitude (C)
Mode S	PR+A+C+24 bit code and selective interrogating(S)
ADS-B	PR+A+C+S+ own-ship position reporting (ADS-B)

U-space?

U-space or “drone airspace”. Will be set up near airports and cities in what is today G.

U-space will require autonomous electronic conspicuity of all aircraft.



What is ADS-B in?

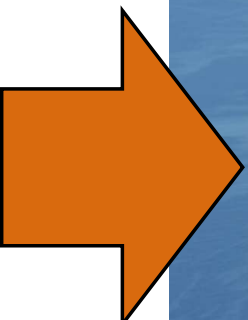
- Mode S
- PBN
- ADS-B
- U-space

ADS-B out

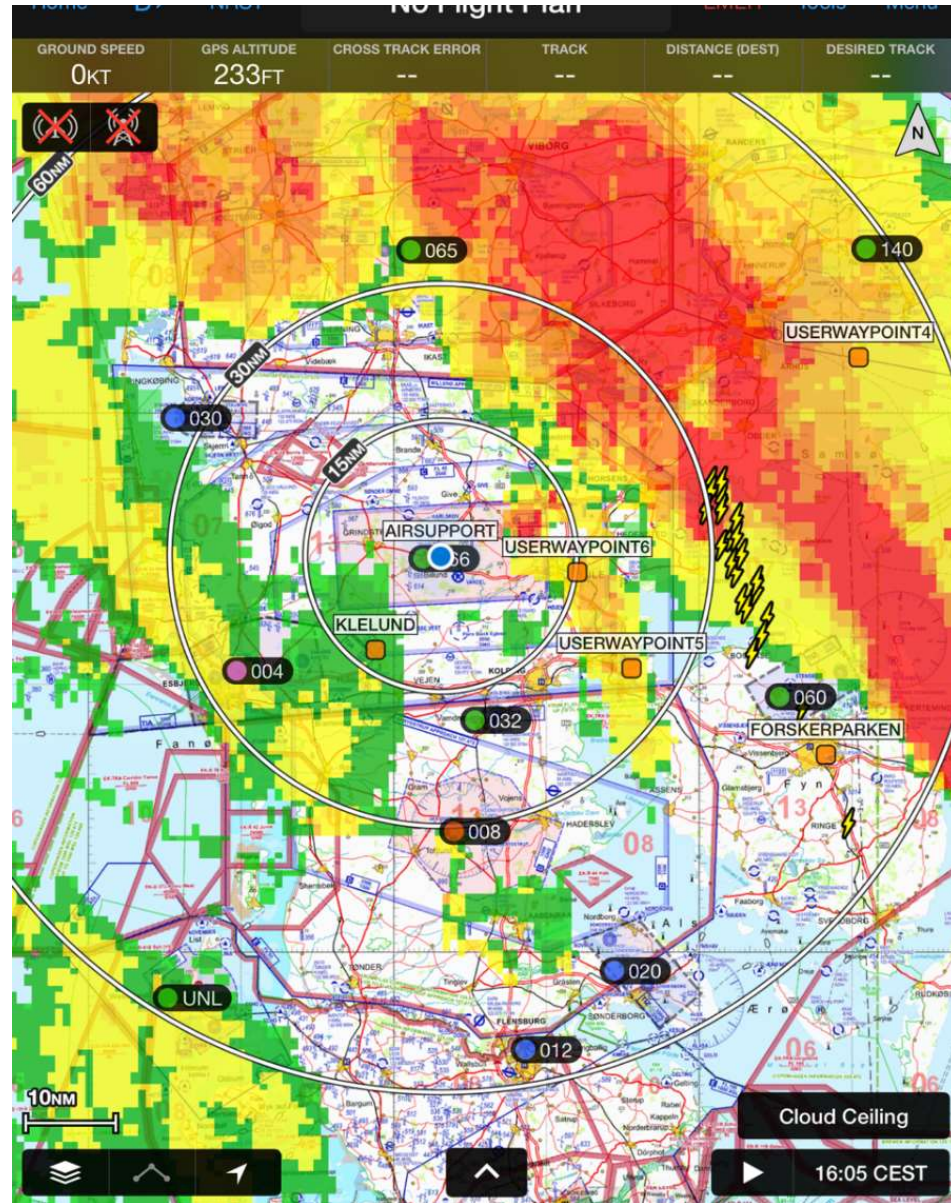


- Weather
- Traffic
- Airspace

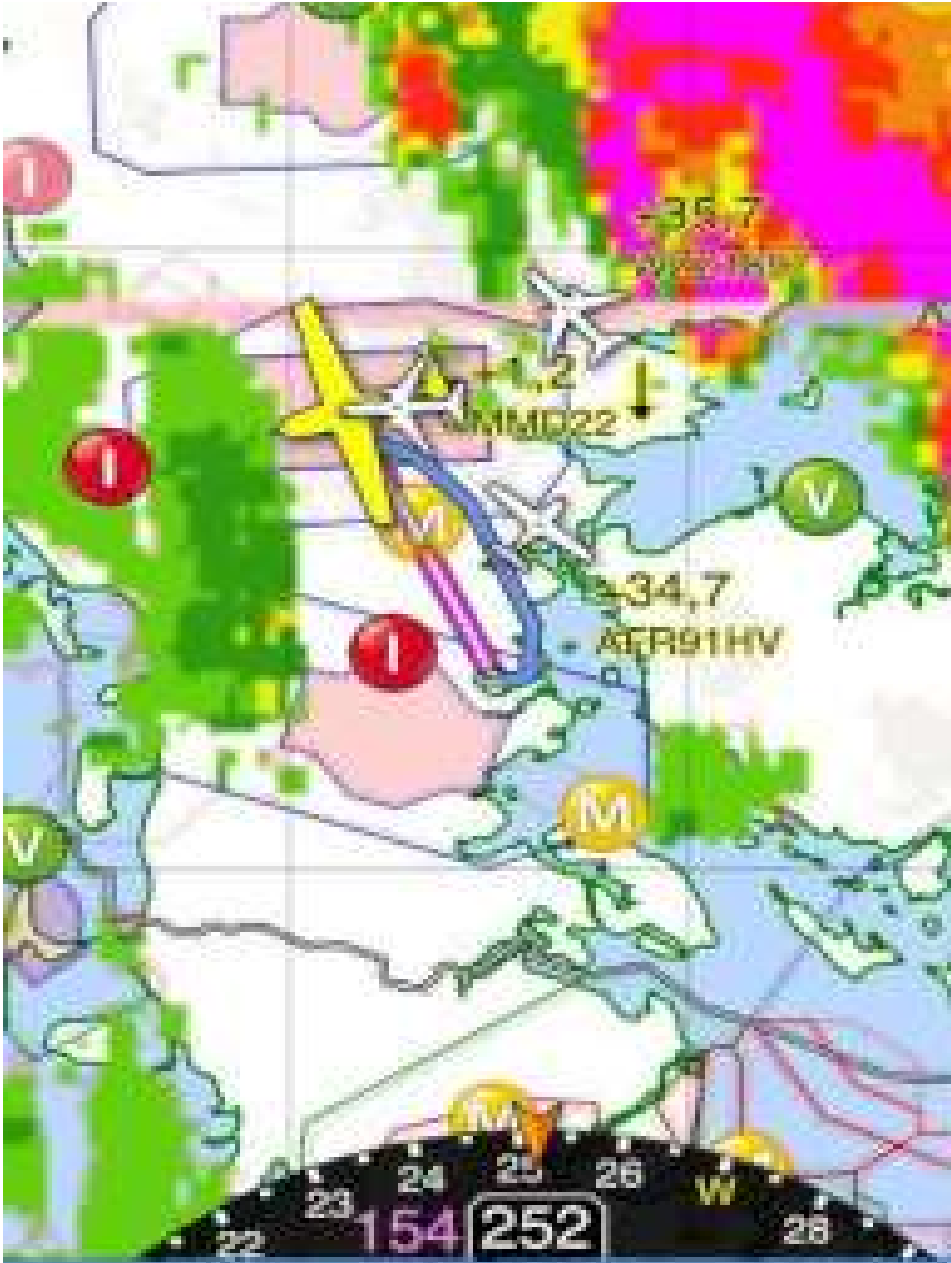
ADS-B in



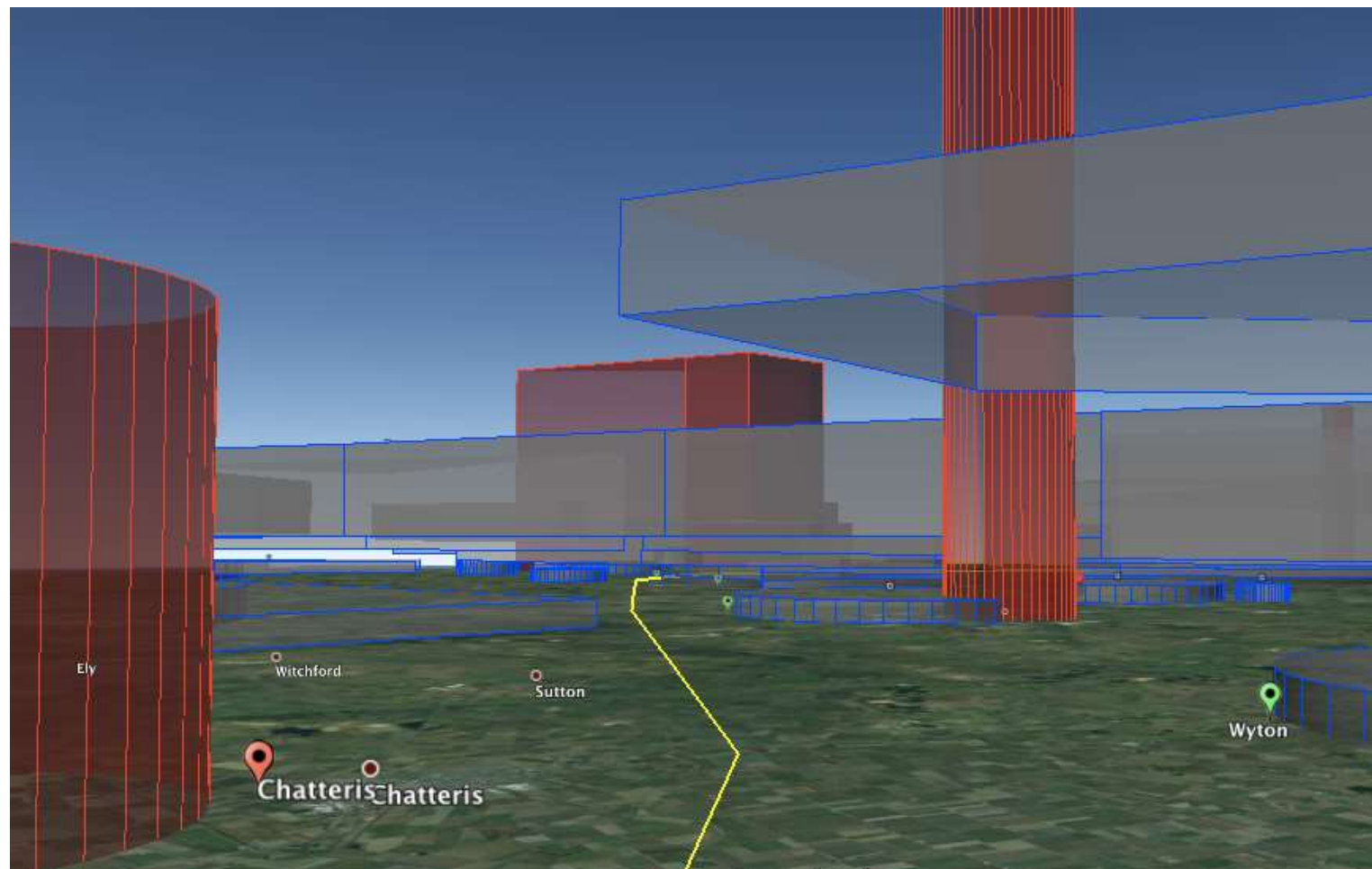
Live Weather



Live Traffic



Live Airspace



Sudden
change
of airspace



Ground radar

air to air
ground to ground



Statistics from the USA show increased safety:

53% 89%

One box can fix all

Transponder A,C,S – give access to all controlled airspace in Europe.
PBN-navigation give access to fly IFR in controlled airspace.
ADS-B – gives access to forthcoming controlled airspace and U-space.

Traffic and collision warnings are presented in real time.
Weather and airspace can be updated every 15 minutes.



ADS-B is the gold standard

Other systems can give collision warning. TCAS, Flarm

Other systems can give traffic information. Pilot Aware

Other systems can provide weather. Sattellite, GSM

Other systems can give access to U-space. GSM



ADS-B is the **only** solution to provide:

- PBN navigation and future IFR-flying

- access to future controlled airspace and U-space

- weather, traffic and collision warning

- while using protected frequencies set aside for aviation (978, 1030 and 1090 MHz.)

The test in Norway

2022: Two test ground stations @ Oslo and Bodø

Set-up like the USA - except air to air UAT @ 978 MHz.

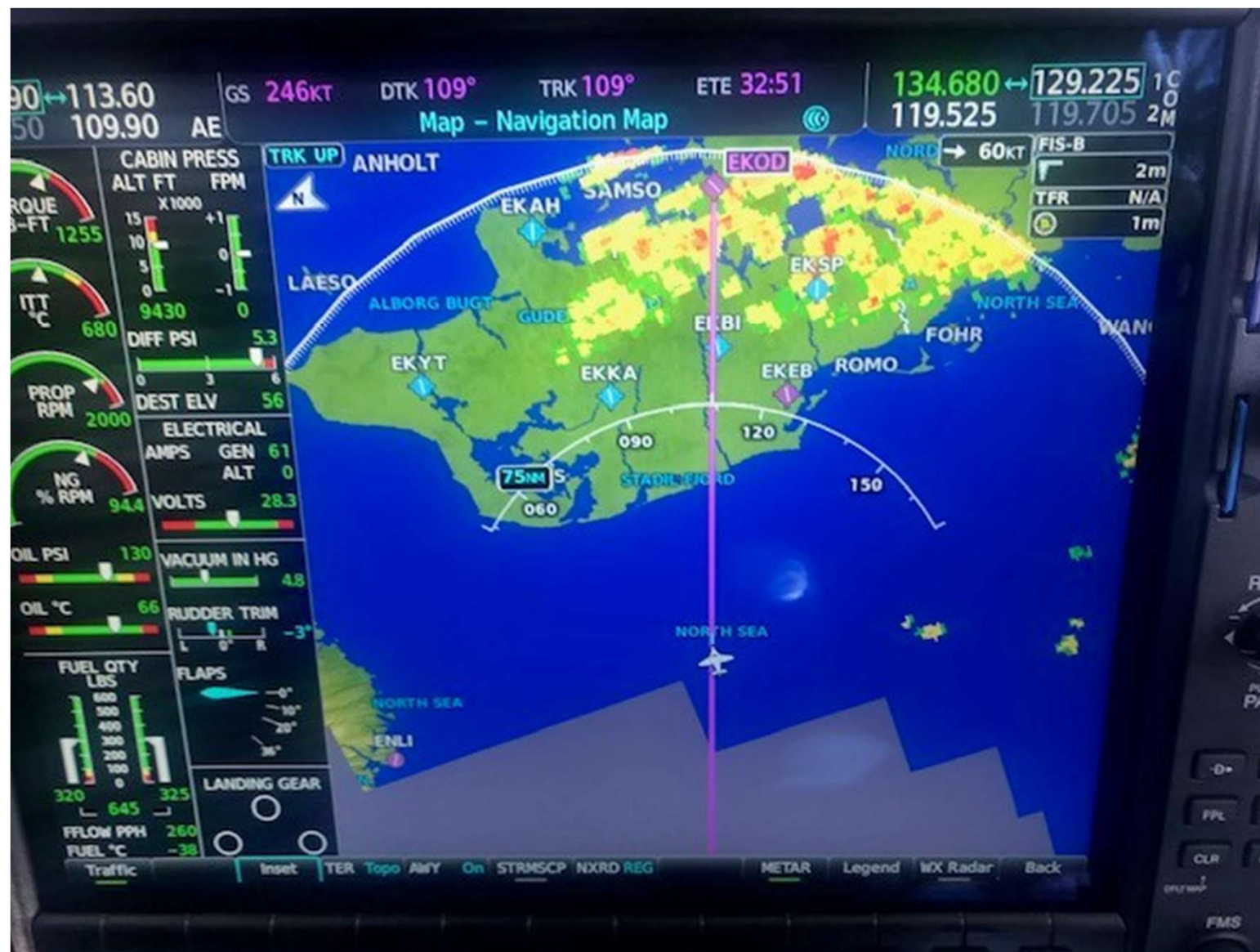
2025: Ten station test will give topography data

2030: ADS-B is proposed to be mandatory in all controlled airspace

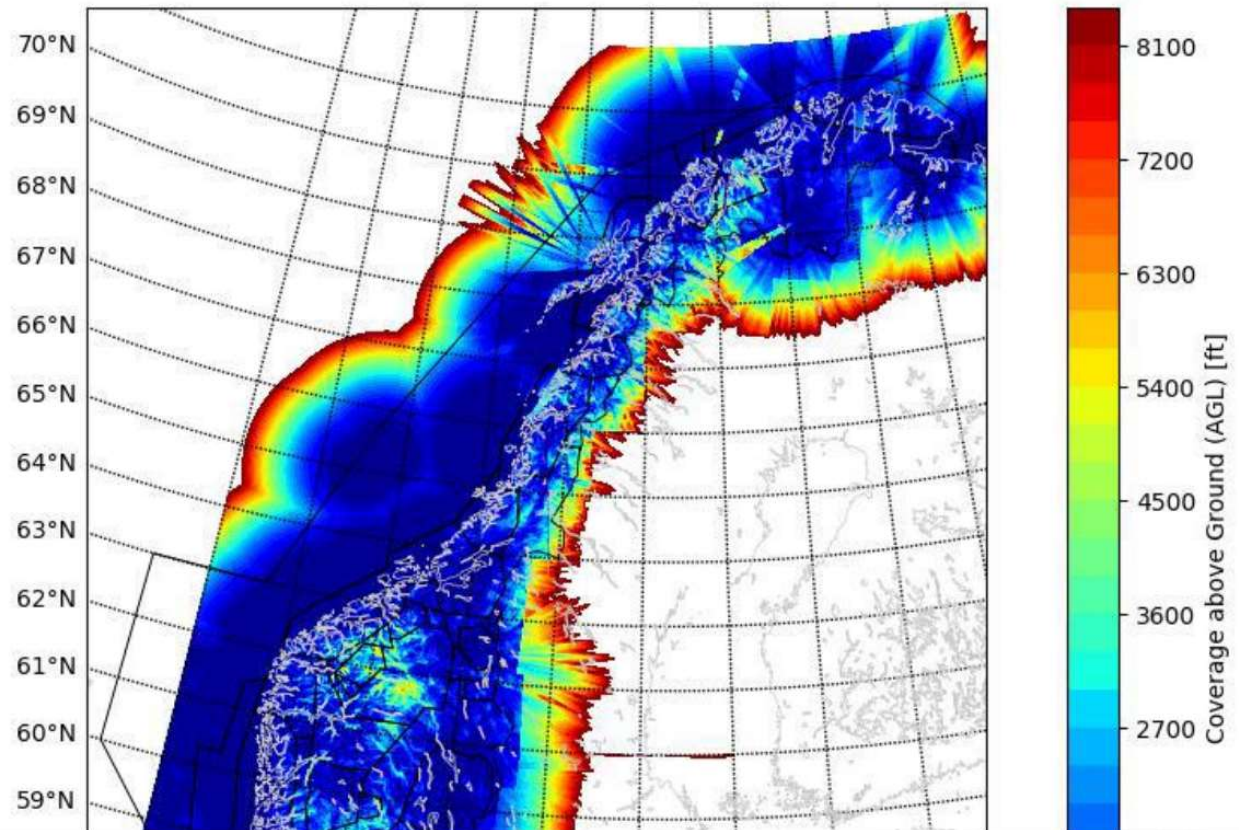


Range

power
line of sight
number



Existing ADS-B coverage




GNSS

- an achilles heel?

Map:

**What will NATO
look like if Finland
and Sweden join?**



An aerial photograph of a forested mountain ridge. A prominent snow patch runs along the ridge, and a tall, thin mast structure is visible on the right side. In the background, a city and a large body of water are visible under a blue sky with light clouds.

The first UAT sender for Norway is already built by Rudy Müller of uAvionix. It will be mounted in this mast in Oslo in August 2022.







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Thank you for your time.